

The Heart of the Tree





The Heart of the Tree

Dedicated to Abbe Ehlers

*Chair, Tree City USA Citizens Advisory Committee
2004- 2009*

*For her tireless efforts to protect and preserve
Springfield's urban forests.*

What does he plant who plants a tree?
He plants a friend of sun and sky;
He plants the flag of breezes free;
The shaft of beauty, towering high.
He plants a home to heaven anigh
For song and mother-croon of bird
In hushed and happy twilight heard --
The treble of heaven's harmony --
These things he plants who plants a tree.

What does he plant who plants a tree?
He plants cool shade and tender rain,
And seed and bud of days to be,
And years that fade and flush again;
He plants the glory of the plain;
He plants the forest's heritage;
The harvest of a coming age;
The joy that unborn eyes shall see --
These things he plants who plants a tree.

What does he plant who plants a tree?
He plants, in sap and leaf and wood,
In love of home and loyalty
And far-cast thought of civic good --
His blessing on the neighborhood
Who in the hollow of His hand
Holds all the growth of all our land --
A nation's growth from sea to sea
Stirs in his heart who plants a tree.

— Henry Cuyler Bunner

ACKNOWLEDGMENTS



Tree City USA Citizens Advisory Committee Springfield, Missouri

The Tree City USA Citizens Advisory Committee advises City Council and City Departments regarding the City's trees and our community's urban forest and assists in continuing to qualify Springfield as a Tree City USA Community.

In addition to citizens at large, the Tree City USA Citizens Advisory Committee includes representatives of the following:


Developers Issues and Input Group (DIIG)
Community Foundation of the Ozarks
Neighborhood Associations
Ozark Greenways, Inc.
City of Springfield Public Works Department
Springfield-Greene County Parks Department

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City Utilities of Springfield
City of Springfield Public Works Department
Springfield-Greene County Parks Department
Missouri Department of Conservation
Missouri Community Forestry Council
Show-Me Yards & Neighborhoods

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INTRODUCTION

Many of us have read these words of Dr. Seuss to our children, generation after generation. And still, we do not speak loudly enough for the fragile trees. Too often we watch in stunned silence as the community forest disappears from our landscape, leaving a hole, literally and figuratively, in our lives. We watch the trees topped, bulldozed, and cut down, and feel an emptiness when we realize that nothing of such incomparable worth can grow in their place in our lifetime.

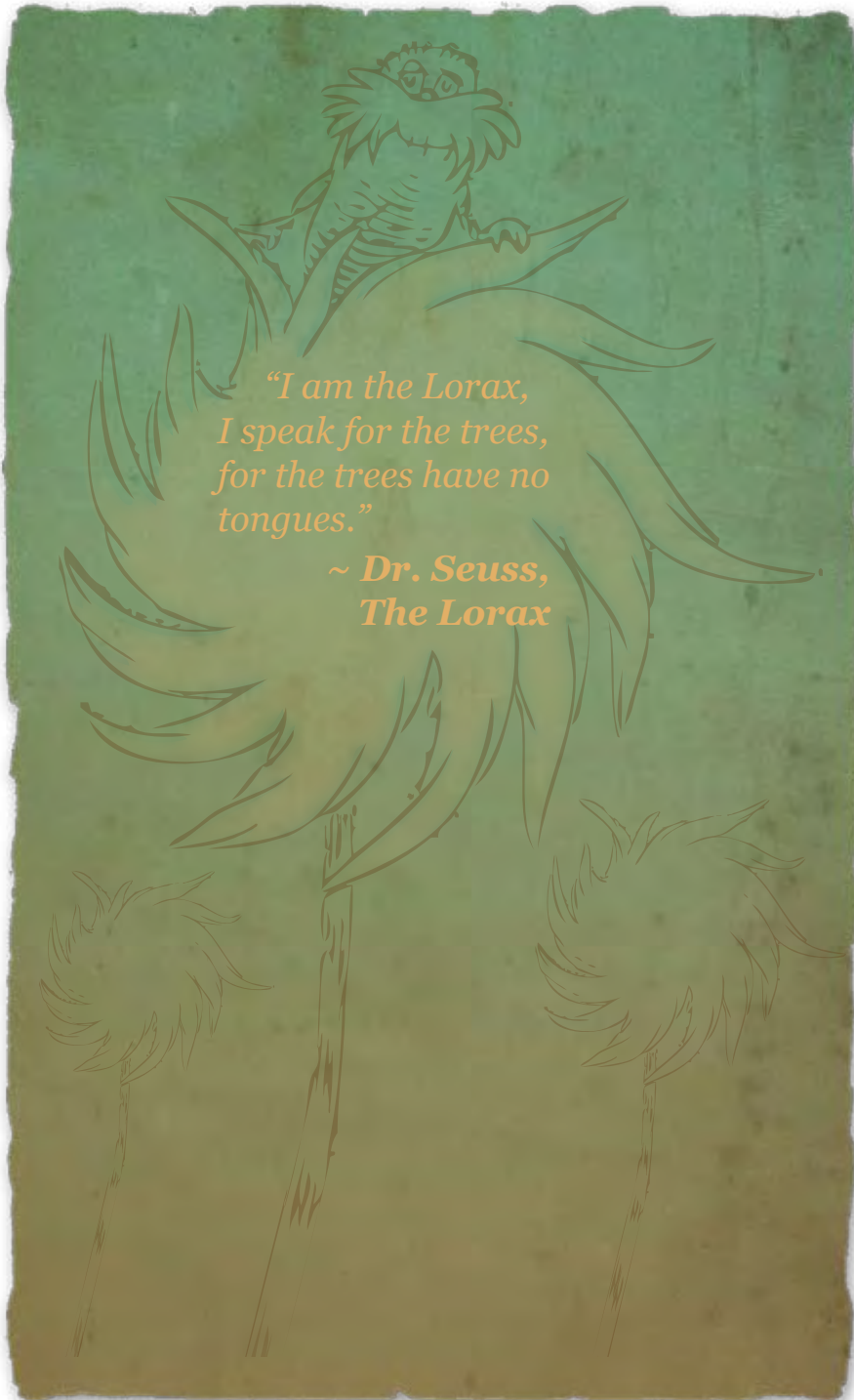
If the poetry of the Lorax is not sufficient to convince us to attend to our trees, at the very least we should be appalled by the environmental and economic devastation left in the wake of our lack of attention. Springfield lost 40 percent of the trees lining its streets between 1961 and 2001.* The crushing blow dealt the public tree canopy by the ice storm of 2007 destroyed another 13 percent, targeting in large measure the oldest and largest of our trees. This number does not include the loss of nearly 20 percent of the trees in the maintained areas of our public parks. This significant loss of more than one-half of our public trees in less than 50 years has multiple, negative consequences for our community.

Trees provide a variety of positive effects on the infrastructure, the inhabitants, and the environment of Springfield.

This booklet is filled with information to help each of us care for and value our trees. It includes a wealth of resources available to all of us as we protect and expand our community forest.



* The geographic footprint of the measured areas is the same, even though the city has grown in size since 1961.



BENEFITS OF TREES

Social and Economic Benefits

Just being around trees makes you feel good. Can you imagine your community without trees? Trees, especially in urban areas, have numerous social benefits. For example, the addition of trees to a neighborhood or a business district can greatly improve the mental and physical health of residents and workers. In fact, the University of Cambridge did a study on job satisfaction of employees of businesses with a view of trees from their offices. They found that these employees suffered from fewer illnesses than workers without a view of trees.

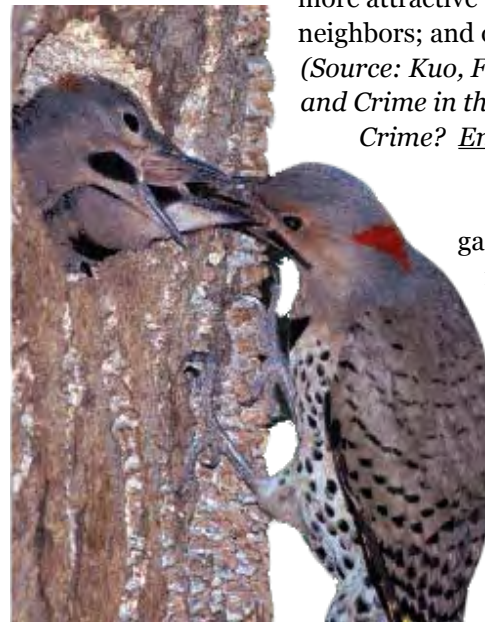
Another example is children with learning disorders. As a form of therapy, children that suffer from Attention Deficit Hyperactivity Disorder (ADHD) can benefit from the presence of trees and other greenery. Kids with ADHD have been proven to be calmer, more responsive, and better able to concentrate when in a space with lots of trees. (Source: Taylor, A.F.; Kuo, F.; Sullivan, W. 2001. *Coping with ADD: The Surprising Connection to Green Play Settings. Environment and Behavior*)

Have you considered that planting a tree can significantly increase your property values? The value of trees on property can easily equal up to 10 percent of that property's value. Neighborhoods with trees are more attractive to visitors, potential buyers, renters, and neighbors; and often are reported as having less crime. (Source: Kuo, F.; Sullivan, W. 2001. *Environment and Crime in the Inner City: Does Vegetation Reduce Crime? Environment and Behavior 33(3).*)

Take a stroll through the community gardens and neighborhood parks and notice how your stress is reduced through the peace and quiet, by the beauty of the area, and by enjoying the multitude of urban habitats for birds, animals, and insects.

“For in the true nature of things, if we rightly consider, every green tree is far more glorious than if it were made of gold and silver.”

~ Martin Luther



Environmental and Energy-Saving Benefits

Our communities benefit in several different ways from the positive effects of trees through the reduction of noise, erosion, and other environmental risks.

The ozone layer in the upper atmosphere filters potentially damaging ultraviolet light from reaching the Earth's surface. Trees work as an additional filter to reduce the levels as they reach our urban areas, particularly by providing shade in playgrounds, schoolyards and picnic areas. For more information on protecting yourself from overexposure to ultraviolet light, visit the Environmental Protection Agency's (EPA) Sunwise site at www.epa.gov/sunwise.

Trees also absorb sound and reduce noise pollution. This is especially important for people who live near freeways. In some cases, a well-planted group of trees can reduce noise pollution by up to 10 decibels. (Source: *New Jersey Forest Service*)

Trees reduce urban runoff and erosion by storing water and breaking the force of rain as it falls. The United States Department of Agriculture reports that 100 mature trees can reduce runoff caused by rainfall by up to 100,000 gallons, or 3 average size residential swimming pools. In urban areas, heavy rains quickly saturate the ground and turn excess rainfall into runoff. Add large amounts of water-resistant surfaces, such as parking lots, and flooding and polluting of open water bodies becomes worse. Trees, along with other types of vegetation, can help reduce this problem by decreasing the volume of runoff. Researchers found that evergreens, conifers, and trees in full leaf can intercept up to 36 percent of the rainfall that hits them.

Trees can help reduce what is known as the "heat island" effect. As urban areas develop, changes occur in their landscape. Buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist become impermeable and dry. These changes cause urban regions to become warmer than their rural surroundings, forming an "island" of higher temperatures in the landscape. These islands can affect communities by increasing peak energy demand, air conditioning costs, air pollution, heat-

related illnesses, and even affecting the quality of our water. The EPA recommends strategically planting trees that will shade buildings, parking lots, and streets. Researchers have found that planting deciduous (shed their leaves in the fall) trees to the west is typically most effective for cooling a building, especially if they shade windows and part of the building's roof.

A recent study by the Lawrence Berkeley National Laboratory modeled the effects of shading homes with trees or vegetation in seven U.S. cities. By providing 20 percent tree canopy – the equivalent of planting one tree to the west and another to the south of a home – could achieve annual cooling savings of 8 to 18 percent and annual heating savings of 2 to 8 percent. (Source: *ArborDay.org/globalwarming/summershade.cfm*)

For more tips on how planting trees and other vegetation can help to reduce the urban heat island effect, visit www.epa.gov/hiri.



WORKING WITH ARBORISTS

You may need to consult with an arborist before cutting tree roots to put in a new sidewalk, or before doing other construction work. People often hire arborists to do pruning, which may be necessary to thin branches, provide better structure, control the size of the tree, reduce wind resistance, or prevent branches from interfering with wires.

Arborists can also help by fertilizing, providing lightning protection systems, and installing supports between forked trunks and branches. Some homeowners hire arborists to check on their trees once or twice a year. This can be a good approach, for it catches problems before they do irreparable damage.

When hiring an arborist, keep these tips in mind:

- Determine if the individual is actually certified as an arborist, or ask for a list of certified arborists, by contacting:

The International Society of Arboriculture

Post Office Box 3129

Champaign, IL 61826-3129

(217) 355-9411

www.isa-arbor.com/findArborist/findarborist.aspx.

- Beware of “door knockers,” especially after storms when nonprofessionals are looking for an easy way to make quick money. Most reputable arborists have all the work they can handle without going door-to-door.
- Don’t be rushed, even if a company says they will give you a 10 percent discount for a decision today. Do not pay in advance. Verify city business license: www.springfieldmo.gov/webapps/buslic.
- Ask for certificates of insurance, including proof of liability for personal and property damage and worker’s compensation. Then phone the insurance company to make sure the policy is current. In some cases, you may be held financially responsible if an uninsured worker is hurt on your property or damage is done to a neighbor’s property.
- Ask for local references or other jobs that the company or individual has done. Then look at these jobs and, if possible, talk to the former client.

*“He who plants a tree
plants a hope.”*

~ Lucy Larcom

- Determine if the arborist is a member of the American Forestry Association, the American Society of Consulting Arborists, the International Society of Arboriculture, or the Tree Care Industry Association. Membership does not guarantee quality, but a lack of membership can cast doubts as to the level of the person's professionalism.
- Topping is the severe cutting or heading back of the major structural limbs of a tree. A good arborist will recommend topping a tree, only under very rare circumstances as a last resort, such as to save the tree after severe damage to its crown.
- If the arborist recommends tree injections of pesticides or other pesticide applications, he or she must have a valid Missouri pesticide applicators license for ornamental and turf pest control (Category 3).
- A conscientious arborist will not use climbing spikes unless the tree is being removed.
- Tree removal is a last resort. Beware of an arborist who is eager to remove a living tree.
- To save money, get together with neighbors and ask about a group discount.
- Find out exactly what work is to be done and how much you will be charged. Work may be done for a single price or for an hourly fee, plus the cost of materials. If an arborist uses the latter pricing method, make sure you understand what the maximum charge would be; obtain an estimate in writing.
- Unless you know and are comfortable with the arborist, get more than one estimate. You may have to pay for the estimates--and it will take more time--but it will be worth the investment.
- Don't always accept the low bid. You should examine the credentials and the written specifications of the firms who submitted bids and determine the best combination of price, work to be done, skill, and professionalism to protect your substantial investment.



- Make sure the contract specifies the dates that work will begin and end.
- Find out what cleanup work will be done and when. Decide who gets any firewood or wood chips. If you will get the firewood, will it be "cut into 16-inch lengths and stacked by the garage"?
- Find out if tree removal includes grinding out the stump and surface roots to one foot below grade, filling the hole with topsoil, and planting grass.



Sources:
How to Hire
an Arborist, Tree
City USA Bulletin
No. 6, National Arbor
Day Foundation, 100 Arbor
Avenue, Nebraska City, NE 68410

Why Hire an Arborist,
International Society of Arboriculture,
PO Box 3129, Champaign, IL 61826-
3129

Kevin Harrel, ISA
Certified Arborist, PO Box 14076,
Springfield, MO 65814



SELECTION, PLANTING AND MAINTENANCE

Tree Selection

Planting the right tree in the right place takes some thought and planning. The following are some key ideas to consider before selecting the specific tree you will plant.

First, consider why you want a tree. What do you want that tree to do for you? Put some thought into your purposes. The following are some common purposes for planting:

- Landscape the house or yard
- Windbreaks – help reduce heating and cooling costs; screen an objectionable view; reduce noise; capture dust
- Attract Wildlife – trees are the feeders you never need to fill
- Control soil erosion

Next, analyze your planting site. Consider how much space you are willing to give the tree and how much shade the location receives.

- *Mature Height:* How much overhead space do you have? Are you limited by overhead power lines or by the house?
- *Mature Spread:* How wide do you want your tree to become? How much lawn space are you willing to give up?
- *Shade:* How much shade does the planting location receive?

Soil has a profound effect on the long-term health and vigor of a tree. Consider these points:

- *Drainage:* Does your soil pool or collect water? Does the planting site drain very slowly after a rain? Does the water in the yard drain to your planting location?
- *Composition:* Is your soil mostly rock, mostly clay, or somewhere in between?
- *Compaction:* Has your house been built within the last five years? During construction, did the developer add top soil or remove top soil? How does the grass grow in your yard?

“The best time to plant a tree was 20 years ago. The next best time is now.”

~ Chinese Proverb

When planting for energy savings, particular care should be given to location. The following guidelines can help lower heating and air conditioning costs and city-wide energy demand:

- To shade from summer sun, plant deciduous (shed leaves in the fall) trees to the west, southwest, southeast, and east of a building. Special care should be given to trees planted directly to the south. These trees may not provide much shade in the summer when the sun is high in the sky, and may block desired wintertime sun when the sun is low in the sky.
- Deciduous trees work well, as they balance energy requirements over the course of a year. In summer, foliage cools buildings by blocking solar radiation. In winter, after the leaves have fallen, the sun's energy passes through trees and helps to warm buildings.
- If there is not enough space for trees, grow vines on a vertical or horizontal trellis to shade the west and east windows and walls of buildings.
- To block winter wind, plant a row of evergreens perpendicular to the main wind direction, usually to the north or northwest of a building. Ideally, the row should be about 50 feet away, be longer than the width of the building, and grow to twice the height of the building.

Utilizing Native Species

What is a native plant? A plant that originated in Missouri and was not introduced. A plant that existed within the state borders prior to the arrival of settlers.

Why should I plant natives? Native plants conserve soil and water, provide the backbone for non-polluting landscapes because they don't need fertilizers or pesticides, support a diversity of wildlife through improved habitat, reduce long-term maintenance after plantings are established, contribute to fewer losses because natives are winter hardy and drought tolerant and are less prone to destructive insects and diseases. (www.GrowNative.org).

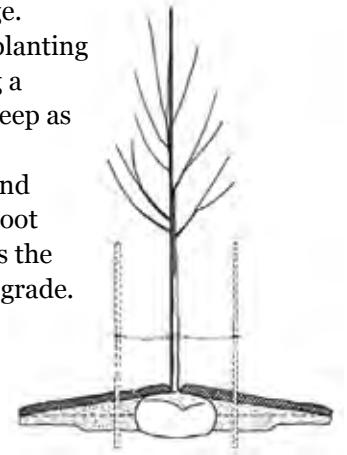
Before You Dig

Call Missouri One Call at 811 or 1-800-344-7483 before you select a site. Make sure all underground utilities are located.



How to Plant a Tree

- Locate a clear, open site for your tree with generous rooting area and good drainage.
- Loosen and blend the soil in the entire planting area 6-10 inches deep. In the center, dig a hole at least twice as wide, but only as deep as the root ball.
- Remove tree from burlap or container and place on solidly packed soil so that the root collar (where the tree's main stem meets the roots) is slightly above the surrounding grade.
- Backfill hole and lightly pack the soil into place around the tree no deeper than the root collar is at ground level.
- Spread a 2-3 inch layer of mulch in the entire area, leaving a 6-8 inch space between the trunk and the mulch.
- Stake tree so that it can flex in the wind. Attach stake to tree using discarded garden hose or rubber inner tubes. Remove them after six months.
- Water thoroughly, but do not flood the hole. Water twice a week during dry periods. (5 gallons per week per caliper=diameter=inch)



Mulch: Your Tree's Best Friend

Mulch is any material placed on the soil to conserve moisture and improve growing conditions. Common mulches include wood chips, bark, pine needles, and compost. Mulching is one of the most valuable things a homeowner can do for a tree's health. Mulch covering all of a part of a tree's root zone can reduce soil moisture loss, control weed and grass competition; protect the trunk from lawnmowers; and improve soil structure. Mulch also gives landscapes a well-groomed appearance. However, if mulch is applied too deep or the wrong material is used, it can actually harm trees and other plants.

Benefits of Mulching

- Helps maintain soil moisture; evaporation and the need for watering is reduced
- Protects the trunk and surface roots from mowers and string trimmers



- Helps control weeds and grass
- Insulates the soil surface, keeping it warmer in winter and cooler in summer
- Improves soil structure, aeration, and drainage
- Increases soil fertility as organic matter decomposes
- Provides easier lawn maintenance
- Creates a well-cared-for appearance

Advantages of Mulching

- Preserves soil moisture
- Moderates soil temperatures
- Provides microbe habitat
- Absorbs rainfall and runoff
- Recycles organic materials
- Discourages weed growth



Types of Mulch

- Organic mulches include wood chips, pine needles, shredded bark, nut shells, compost mixes, and leaves. Organic mulches decompose at different rates depending on the material and must periodically be replenished.
- Inorganic mulches include decorative stone, lava rock, pulverized tires, and geotextile fabrics. Inorganic mulches are useful in xeriscaping and for soil protection in high traffic areas, but are not recommended for mulching around trees. Heat reflected from inorganic mulches may be high enough to kill thin-barked trees.

Proper Mulching

- Check soil drainage in the area to be mulched. Determine if there are trees or plants that may be affected by the type of mulch. Most organic mulches work well in most landscape situations. Some plants may benefit from mulches such as pine needles or bark that acidify the soil.
- Apply a 2- to 4-inch layer of mulch over well-drained soils. Use a thinner layer on poorly-drained soils. The wider the mulch ring, the greater the benefit. Mulch out to the tree's drip line if possible.
- Do not pile mulch against the tree trunk. Pull mulch back several inches from the trunk so the base of the trunk and root crown is exposed. The mulch ring should resemble a "doughnut," not a "volcano."

- If mulch is already present, check the depth. Do not add more if a sufficient layer is already in place. Rake old mulch to break up matted layers and improve its appearance.
- Composted wood chips make good mulch, especially when it contains a mixture of leaves, bark, and wood. Fresh wood chips may be used around established trees and shrubs. Avoid using uncomposted wood chips that have piled without exposure to oxygen. Sawdust, straw, and fresh grass clippings are not recommended.
- Organic mulches are preferred to inorganic materials. Organic mulches should be well-aerated and composted. Avoid sour-smelling mulch.

If a little is good, then. . . over-mulching your tree or piling mulch against the trunk can:

- Promote excessive soil moisture and root rots
- Cause inner bark tissue to die
- Lead to insect and disease problems
- Create habitat for rodents that chew the bark and girdle the stem
- Lead to anaerobic conditions that produce alcohols and organic acids toxic to young plants
- Cause imbalances in soil pH
- Become a matted barrier that prevents the penetration of water and air

How to Water a Tree

How much water is needed?

Any amount of water is better than none during dry conditions. However, most experts agree that deep, thorough watering is best. A single application of water equal to one or two inches of rainfall is considered generous. The amount of water applied with a sprinkler can be measured by placing coffee cans within the watered area. The average depth of water in the cans is the amount of water applied.

Established trees may be watered to avoid stress by several methods. Surface irrigation can be accomplished with any lawn watering device, such as a whirling or oscillating sprinkler. A hose running very slowly on the ground is effective, but must be moved frequently for an even distribution. With any watering method, care should be taken to

apply water slowly enough to prevent excessive run-off. Very dry soils may resist water because of surface tension. Wetting agents, available from lawn and garden suppliers, may be applied to the ground prior to watering to improve penetration.

Watering for recently planted trees is essential. Trees dug from nursery beds may lose roots when they are lifted. The tree is then much less efficient at taking up water and must receive more water than a tree with established roots. Extra water should be provided for at least two years after planting.

An excessive amount of water, especially in heavy or tight clay soils, may force air from the soil and cause roots to suffocate. However, many more planted trees are lost from dryness than from overwatering. Keep soil moist, but not soggy.

Trees should NOT be topped?

“Experts agree. Never top a tree.”

Eight good reasons to NOT top a tree:

- **Starvation:** Topping removes so much of the tree’s leafy crown that it dangerously reduces the tree’s food-making ability.
- **Shock:** By removing the protective cover of the tree’s canopy, bark tissue is exposed to the direct rays of the sun. The resultant scalding can cause the tree’s death.
- **Insects and Disease:** The exposed ends of topped limbs are highly vulnerable to insect invasion or decay fungi spores.
- **Weak Limbs:** New branches that grow from a stubbed limb are weakly attached and more liable to break from snow or ice weight.
- **Rapid New Growth:** Instead of controlling the height and spread of the tree, topping has the opposite effect. New branches are more numerous and often grow higher than before.
- **Tree Death:** Some tree species can’t tolerate major branch loss and still survive. At best, they remain weak and disease-prone.
- **Ugliness:** A topped tree is a disfigured tree. Even with new growth, it never regains the grace and character of its species.
- **Cost:** The true cost of topping is often hidden – lower property values, expense of removal, and replacement if the tree dies.

If large limbs must be removed, select only the problem or offending limbs and remove them entirely, using the three-cut method, leaving no stubs. If possible, remove smaller branches, leaving larger limbs.

What if a tornado or other catastrophe breaks or kills most of the crown? Remove limbs as needed, and if it is necessary to make “stubbed off” cuts, make them at roughly 45° angles with the limb to encourage eventual wound closing. It is interesting to note that storm damage to trees can many times be traced to earlier topping or other poor pruning practices.

A Pruning Primer

Along with the science of cultivating plants, the art of pruning has evolved. The skilled gardener knows methods for manicuring magnolias, rules for reducing roses, and tricks for trimming trumpet vines. Although not everyone has the inclination to become an expert, some information is needed for a clear understanding of basic pruning techniques.

Here are two ideas that should be kept in mind before leaping into your trees, saw in hand: First, it is very difficult to change the natural growing habit or ultimate size of a plant by pruning. A tree or shrub grows to look the way it does because of its genetic makeup and local environment. Pruning may change its shape or form temporarily, but not ultimately. A silver maple is going to grow over 50 feet tall with wide spreading branches, and with somewhat brittle wood. Pruning will not change this. A pin oak’s branches are going to droop; a weeping willow is going to weep. Will pruning change it? Nope. Why not appreciate the natural growth habit of each plant and take this into consideration when pruning?

Secondly, all pruning is potentially harmful. This is because each cut results in a wound which takes energy to close and can provide an entry for diseases. Any removal of live branches also means a loss of food-producing leaves. This immediately puts the plant on a “diet” and forces it to re-establish a balance between the branches and root system.

Does this mean that trees and shrubs should never be pruned? No, but you may use it as a good excuse for doing less of it at a time. Most healthy plants can tolerate at least some pruning that will allow us to help them. Some pruning is essential. Broken, hazardous,

or dead limbs and branches should always be removed when they are noticed. Limb removal may be necessary for adjacent construction work or for free use of space around a tree. Highly cultured plants grown for flowers, fruits, or foliage will require regular, exacting pruning.

How to Prune a Tree

What is the best time to prune?

This depends upon the objective or goal of the pruning. The natural growth cycle of plants in this climate begins with a flush of top growth in the spring, followed by gradual storing of manufactured food in the roots and slowed top growth, then dormancy. Pruning during the late winter will allow the plant to replace lost branches and foliage during the growing season and will allow resulting wounds to close faster. Since existing roots are ready to support a now reduced top, new growth will appear to be more vigorous.

Bleeding, or loss of liquids moving up from the roots, is a problem with some species when pruned or otherwise wounded in the spring. This can be avoided somewhat by pruning in winter, usually not later than the last part of January. In most years, this will allow the freshly exposed wood to harden before sap flow begins. If only a small portion of the crown will be affected, pruning may be done in mid-summer.

Pruning during the summer, after leaves have fully expanded, will cause a loss of food production because of a loss of foliage. This will, in turn, restrict root development and slow the total growth of the tree or shrub. Moderate pruning at this time will discourage excessive resprouting. Water sprouts or sucker growth might be removed at this time. If a large portion of the top is removed, the plant may be weakened.

What kinds of tools are needed?

Probably not as many tools are needed as you think, but more than a pair of hedge clippers. A good pair of hand pruners will permit cuts to be made on twigs up to about the thickness of a fat pencil. Larger twigs can be removed with longer handled lopping shears, but these are not really necessary for most amateurs. A fine-toothed pruning saw is more versatile and can be used on limbs up to two inches in diameter or more. A coarse-toothed pruning saw is desirable for large limbs.



Pruning equipment should be kept clean and sharp. Diseases can be easily spread from tree to tree after making just one cut on an infected plant. Although diseases are sometimes difficult to diagnose, you should suspect trees with wilted or browning leaves, dead or dying branches, or those that are generally spindly and weak. Every so often, sterilize pruning tools by dipping into or wiping with a fresh batch of bleach/water, mixed about one part bleach to ten parts water or straight denatured alcohol. Be sure to rinse and oil all tools sterilized with bleach before putting them away to prevent rusting.

How should pruning cuts be made?

No matter what the objective, pruning cuts should be made so that the tree or shrub may close the resulting wound as easily as possible. Generally, remove parts of a twig or branch at their origin, so that no stubs remain. Remove tips of branches back to a good bud or to the next larger branch. Try to visualize the result of the pruning before the cut is made. Removal of large, heavy limbs is a job for the professionals. Use common sense in planning the fall of a limb before making cuts. To prevent bark from tearing off below the limb, use the three-cut method.

When should I call on a professional arborist?

When your job looks too big or too dangerous to handle alone. A professional crew will likely be able to do the work much faster and more safely with specialized equipment. Make sure there is a clear understanding of the work to be done and the cost.

How can pruning problems be avoided?

By working with your trees and shrubs. Picture the future size and shape of young plants, taking into consideration their natural growth habit. If possible, do this even before planting them. Select species to perform the way you want them to without extensive pruning. Ask your nurseryman about growth habits of plants, or consult a reference book at the library.

Tree Care During Home Construction

The urban areas are extending beyond the city limits into the country, into the natural environment, into the open space, and into the forests. Home sites are selected to take advantage of existing trees that provide landscaping, shade, screening, wildlife food and cover, cooling, and pleasurable viewing.



Building sites with trees are typically valued significantly higher than comparable lots without trees. People decide to keep the trees, but the builders don't always cooperate. The result? Construction is finished, the builder is gone, and in three or four years, an arborist is hired to cut down the dead trees. Since the trees were not preserved, that part of the natural environment is lost.

The urban growth is going to continue to spread to the forested areas, but that doesn't mean that we must continue to lose our natural environment of trees. If the trees are to be preserved, the homeowner, the architect, the builder, the commercial arborists, and the urban forester must all work together throughout the construction process.

Prior to any construction, the existing conditions in a forested area must be understood by everyone involved.

First, the trees are growing in competition with other trees – competing for sunlight, moisture, minerals, and space. Second, the trees protect the other trees – through shading, by reducing winds, and by slowing soil erosion from the root zones. And finally, the trees maintain themselves through the deposit of leaves and twigs that eventually builds up the soil in mineral content, texture, and porosity. The construction of a house can have drastic, long-range, often fatal effects on the natural tree environment.

The trees in areas of new construction are just as susceptible to injury as any other tree in a city or a forest. Trees can be damaged at the roots, at the trunks, and in the branches. Damage at any of these points will affect the whole tree, and protection of these points will increase a tree's chances for survival.

The best time to start the preservation of the natural tree environment is before any work is started.

An on-site inspection by everyone involved is necessary to ensure that the homeowners, the ones paying the bills, are going to get what they pay for. The actual location of the house might be moved and adjusted with regard to the existing trees. It would be nice if the house could be located where all of the dead and dying trees are located, but more often than not, some good trees will have to be removed. As early as possible, the good desirable trees should be selected for preservation; the other trees can then be removed.

Once that is determined, the homeowners will need more details on the selected trees.

They will need to know the present and future value of the trees and, based on that, can determine how much they can afford to spend on tree preservation. They will need to know what kind of protection the trees will need and how that might affect the construction process. Most homeowners will want to keep as many trees as possible, and an arborist can help in deciding which trees are actually worth the time, trouble, cost, and benefit. From that point, with the homeowner's approval, the work begins – the house work in conjunction with the tree work.

Now, the unwanted trees can be removed.

Most of these can be removed by a bulldozer, but the commercial arborists should be responsible for removing those trees adjacent to the trees to be kept. Their knowledge and experience will help to prevent serious damage to the trees, and they can do it better than the bulldozer operator.

As early as possible, a physical barrier should be established around the trees that are to be preserved.

The barriers will establish the no-violation zone, and that should be a minimum of 20 feet from the trunk. A permanent barrier of wood, wire, posts, or a combination of these materials should be placed around each tree or around each group of trees. This barrier will protect the roots, trunk, and possibly the top from damage.

Everyone must understand that the no-violation zone must be honored.

The area must not be used for storage of lumber, bricks, or concrete. It must not be used for parking the construction trailer. And it must not be used for travel by trucks or other heavy equipment. Access by trucks can be provided along the route of the proposed driveway, with perhaps an additional route from the opposite direction. Except in rare cases, trucks should never be allowed random access close to trees. Here, the most important consideration is soil compaction. Trucks and stored materials can compact the upper soil layers. That will close the air spaces in the soil that are vital in allowing air and moisture to get to the roots. Without air and moisture, roots will die, and that will affect the growth in the tree top, causing dieback of the branches. Once the process of dying roots and branches begins, it is difficult to stop.

There could be a need to cross a no-violation zone to provide for utilities, such as water, gas, electric, and sewer. Although utilities are required for the house, care for the trees doesn't have to be forgotten. A trench alongside a tree trunk might be relatively easy to install, yet it will also cut and damage up to 40 percent of the root system of the tree.

A more difficult process is tunneling directly under a tree trunk, but it is by far a better choice for the tree. The root damage can be reduced 15 percent if you tunnel under the trunk. Keep in mind that trench locations must be decided early; once the tree loses 40 percent of the roots, they can't be glued back on, and the tree has lost support and growth of almost half its root system.

For valuable or important trees, the utility line might be made with curves or corners to allow for going under, rather than around, the trees.

A barrier setting up a no-violation zone will also protect the tree trunk. Too often, bulldozers and trucks rub against a tree trunk and tear off patches of bark. The drivers don't see that as a problem. Without the protection of the bark, the cambium layer and the wood are exposed and thus are more easily attacked by insects and infected by diseases. Those pests are fully capable of getting into the trees on their own. They don't need any help.

In cases when the bark is ripped and torn from the trunk, quick maintenance is necessary.

The jagged edges of the bark need to be cut back to a smooth, even edge. The openings will have to be trimmed and formed to an oval shape, which will allow for maximum growth of callous tissues around the wound to re-establish a protective layer of bark. It is not necessary to apply paint to the wound.

During construction, tree roots and branches will be broken and cut and often left with jagged, irregular ends. The larger roots and branches will heal better if they are trimmed and left with a smooth cut. Treatment of the roots will have to be done after the excavation, of course, and prior to the backfilling. This allows a little leeway in time, but often is a forgotten part of the tree care during construction. Trimming the branches can be delayed some, because they are more easily accessible.

Just remember to trim them.



One of the biggest problems in trying to protect trees during construction is the common practice of adding soil fill around the trees.

Soil filling around trees is said to be necessary to avoid charges of hauling the excavated soil from the construction site. Dozer operators and contractors seem to take pride in their ability to spread the soil to an even and neat-appearing grade. And after their smiles fade away and they are long gone, the homeowner is left with trees that could die within three years.

Soil filling around trees causes compaction of the existing soil, with the same results previously stated. In addition to compaction, the raised surface elevation puts the tree roots farther away from available soil moisture. The compaction closes the air spaces, the elevation removes the moisture supply, and the roots are either starved, suffocated, or both. Again, dying roots cause dying branches and, eventually, dying trees. The damage can be caused by as little as six inches of fill, and yet a filling of six or eight feet is not uncommon.

If possible, a change in grade should be avoided, but if it must occur, the homeowner can still help the trees. Consult with an ISA Certified arborist regarding an appropriate drainage system. With proper installation, followed by watering and fertilizing, the trees will have a better chance for survival.

Another area of concern when trying to preserve the natural tree environment is the final slope and drainage patterns when the construction is complete.

Rainwater from rooftops, driveways, and yards usually moves away from the building. But the rainwater should also move away from the trees. Trees can survive saturated soil for a few days, but prolonged, wet conditions of several weeks reduce available oxygen needed by the roots. Also, chemicals, such as herbicides, gasoline and salt can be carried and deposited by rainwater. When the deposits are left in the root zones of the trees, the trees are going to suffer.

Suggestions for the homeowner:

- Seek advice on trees from commercial arborists, landscape consultants, municipal and urban foresters, nurserymen, and planners.
- Demand cooperation between the tree people and the construction people.



- Put time and money into trees through protection and tree maintenance
- Provide for tree care before and after construction.

The overriding purpose of all these tree care activities is to keep the largest possible number of existing trees without stopping the growth of the urban areas. The trees that are 25-, 50-, and 150- years old are way ahead of those we plant. By giving these old trees a lot of tender loving care, homeowners and communities will receive the benefits of those trees for many years. This is a one by one, tree by tree, acre by acre task, but in total it goes a long way in maintaining a natural environment of trees in our urban areas.

Saving Trees After the Flood Waters Recede

Rushing water from recent flooding in several southwest Missouri counties has uprooted trees and left homeowners faced with the task of repairing the damage or removing the trees.

For some smaller trees (25 feet or less in height), it may be possible to straighten the tree and brace it using guy wires or cables.

“Some type of power lift or equipment is usually needed to pull the tree upright. I don’t recommend attempting this procedure unless at least one-third of the tree’s roots are still in the soil and the remaining exposed roots are compact and undisturbed,” said Bob Schultheis, Agricultural Engineering Specialist, University of Missouri Outreach and Extension.

Before the tree is pulled upright, remove some soil from beneath the root mass so the roots will be placed below the existing soil grade level. Once the tree is back in an upright position, fill in soil as needed. Water the tree to help firm the soil and remove air pockets.

“At this point, attach two or three guy lines to the trunk like you would with a newly-planted tree. Those lines should be placed at a point two-thirds of the height of the tree and to anchors placed 12 to 15 feet from the base of the tree, in order to hold the tree in place. Turnbuckles can be used to tighten these wires,” said Schultheis.

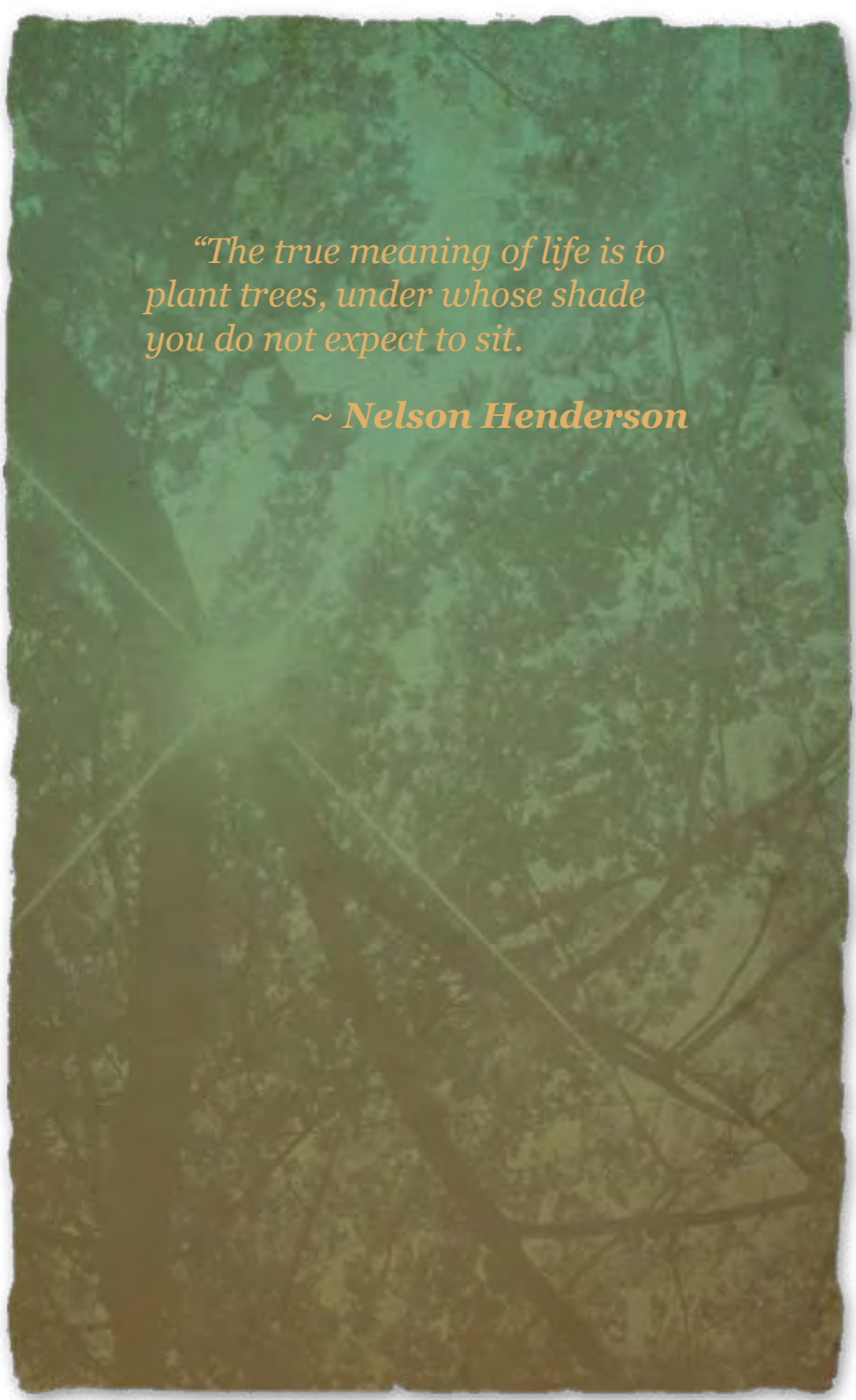


Most large trees cannot be saved and must be removed. This usually requires using a chain saw to cut up the tree into manageable pieces.

Schultheis recommends two safety publications for occasional or inexperienced chain saw users: MU Guide G1959, “Basic Chain Saw Safety and Use,” and MU Guide G1958, “Felling, Bucking and Limbing Trees.”

These guides, and others, are available free from your county University Outreach and Extension Center, or online at www.extension.missouri.edu/xplor.

More information on dealing with a variety of flood-related issues can be found online at www.outreach.missouri.edu/flood.



*“The true meaning of life is to
plant trees, under whose shade
you do not expect to sit.*

~ Nelson Henderson

TREE PROGRAMS

NeighborWoods - A Partnership to Enhance Springfield's Community Forest

The City of Springfield's goal is to develop and maintain our community forest by partnering with the citizens, especially through its neighborhoods. Together we can rejuvenate, enhance, and sustain this valuable community asset by creating community pride and more livable neighborhoods, promoting importance of the community forest, and fostering reforestation partnerships. (www.springfieldmo.gov/trees/neighborwoods)

Tree Registry - Promoting the Pride, History, Beauty, and Benefits of Community Trees

The Springfield Tree Registry was established by the Tree City USA Citizens Advisory Committee to heighten the level of awareness and appreciation of Springfield's urban forest. Contact: Community Foundation of the Ozarks or www.springfieldmo.gov/trees/registry.

The Springfield-Greene County Parks System

The parks system currently consists of 80 parks, spread over 2,000 acres, developed to provide the Springfield community with a wide variety of recreational opportunities and appropriate settings in which to experience them.

The Springfield-Greene County Park Board:

- Arranges memorial tree recognition
- Receives donations of trees
- Cares for and maintains existing park trees
- Provides training for their forestry division staff, maintains staff certifications, and provides equipment for proper maintenance of trees
- Offers educational programs and facilities concerning tree planting and care
- Plants new trees in city parks

If you or your organization would like to donate trees or other plants to be placed in a park, either as a memorial or as a community service project, arrangements can be made by calling the Park Board Office at 417-864-1049. If you have a specific park and location in mind, please indicate this at the time of your call.

Visit www.parkboard.org for more information about the Springfield-Greene County Parks System.

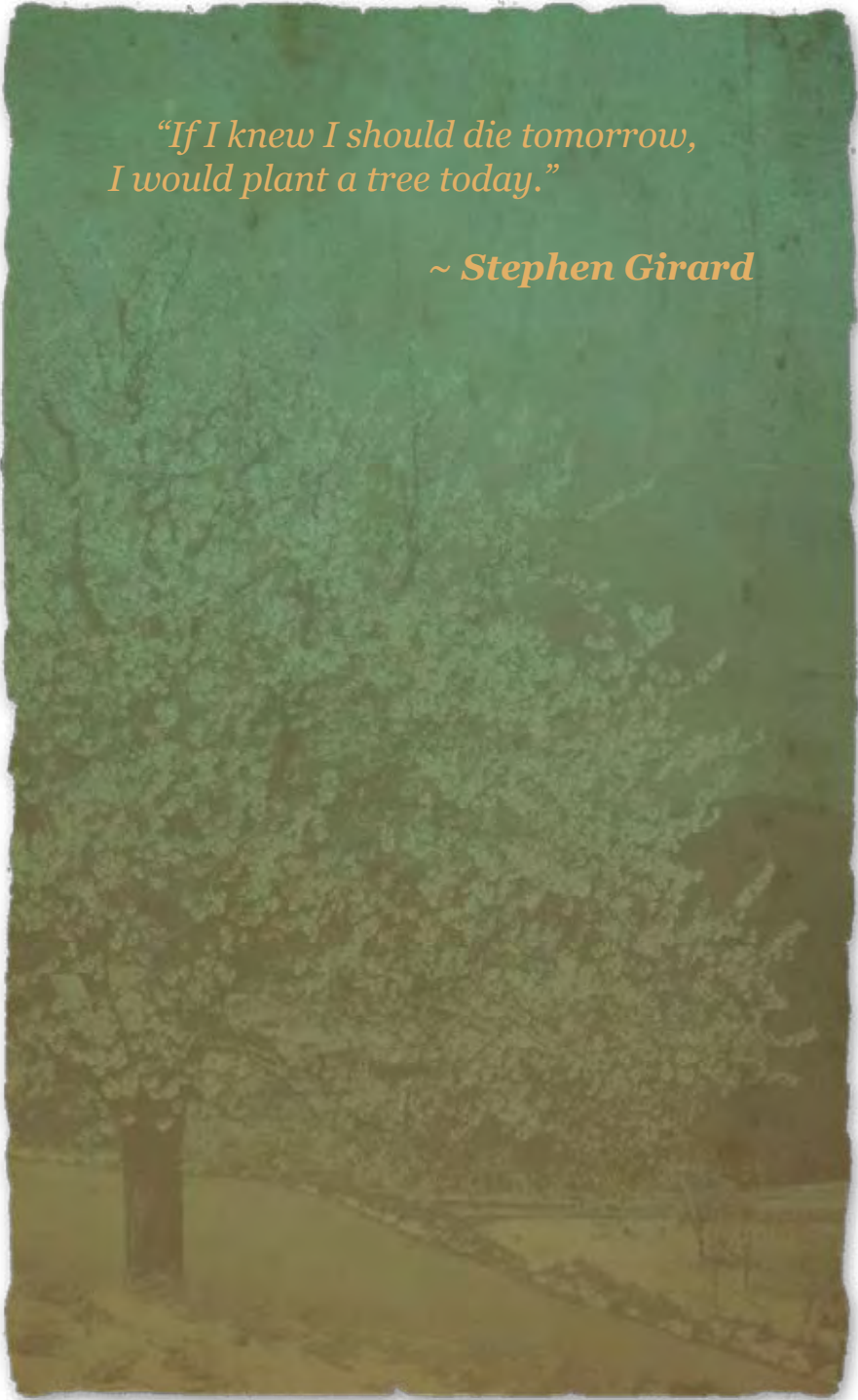
The Tree City USA Citizens Advisory Committee

Springfield is proud to have been designated as a Tree City since 1984. As part of this designation, the city must meet a certain level of spending on tree care, must have an existing tree ordinance, and must hold a yearly, city-wide Arbor Day celebration. The Tree City USA Advisory Committee coordinates the City of Springfield's participation in a number of activities that relates to this designation. The committee is a mayor-appointed city advisory committee with nine members. (www.springfieldmo.gov/egov/boards/detail.jsp?id=35)

Create a Certified Wildlife Habitat

Join the thousands of wildlife enthusiasts across the country who have been recognized for creating havens for neighborhood wildlife in their very own yards. These individuals have provided the essential elements for healthy and sustainable wildlife habitats and have earned the distinction of being part of National Wildlife Federation's Certified Wildlife Habitat™ program. Visit www.nwf.org/gardenforwildlife for more information.





*“If I knew I should die tomorrow,
I would plant a tree today.”*

~ Stephen Girard

LOCAL AND STATE RESOURCES

City of Springfield Public Works

The City of Springfield Public Works Department is responsible for the regulation of tree planting, maintenance and protection of trees planted in the city’s right-of-way. Contact 417-864-1136 or visit www.springfieldmo.gov for more information.

These functions are carried out on each public street or alley open to travel within the city limits.

- Trims and maintains city-owned trees
- Replaces trees removed by street widening
- Monitors the types and number of street trees permitted
- Gives permits required to plant and work on street trees
- Enforces codes to protect street trees from damage

Please make sure to contact Springfield Public Works at 417-864-1136 before planting so we can verify your exact planting location, give you direction regarding the acceptable species for the location, and issue you a permit, if necessary, to do so.

For more information, contact:

Urban Forester
1010 W. Chestnut St.
Springfield, MO 65802
417-864-1136

City Utilities of Springfield

City Utilities of Springfield provides safe, reliable electric service to the residents of Springfield and our surrounding service area, while being environmentally responsible to the urban forest. Our professional foresters have specialized knowledge in line clearance, pruning, and trimming trees.

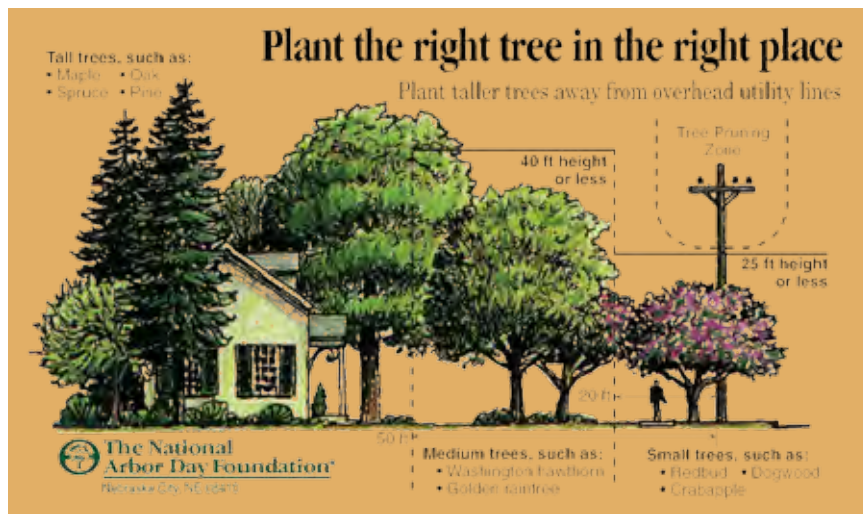
City Utilities:

- Trims and removes trees to provide safe, reliable electric service

- Manages a reforestation program
- Provides educational programs for clubs, professional groups, schools, etc.
- Answers customers' inquiries about general tree care and maintenance
- Advises the public on tree placement for energy conservation
- Provides a free brochure about City Utilities' reforestation program

For more information, contact:

City Utilities Tree Management
301 East Central
Springfield, MO 65802
417-863-9000



Missouri Urban Forestry

The Missouri Department of Conservation provides an online handbook for helping you find the right tree to plant in your urban area, given the number of species available from nurseries and garden centers. Included are facts about how each tree grows, its shape and size, its usefulness and limitations. For more information, visit mdc.mo.gov/forest/urban/urbantree.



Missouri Forestkeepers

The Missouri Forestkeepers Network is a program of the Missouri Department of Conservation and is administered by Forest ReLeaf of Missouri, a statewide nonprofit organization. The program was initiated in 1996 to teach citizens about tree and forest health and to provide an opportunity to share findings through a statewide network. More than 1,800 members now belong to the Missouri Forestkeepers Network. The program is free and open to any interested individual, family, or group. Members receive a starter kit, quarterly newsletter, and information about additional training opportunities. The Missouri Forestkeepers is a volunteer-driven effort. In 2006, network members and other participants volunteered a total of 22,438 hours. (www.mdc.mo.gov/programs/forestkeepers)

Show-Me Yards & Neighborhoods

Show-Me Yards & Neighborhoods (SMYN) is an educational program designed to raise awareness about the role urban storm-water runoff plays in the water quality of nearby streams, creeks, rivers, and lakes. Through voluntary education activities, SMYN offers environmentally responsible alternatives to traditional lawn care and construction practices that contribute to the runoff of contaminants and excess nutrients. They also recognize and commend individuals and professionals who put these techniques into practice. Homeowners can earn an attractive yard sign and professionals can become certified. Show-Me Yards & Neighborhoods is a project of Springfield-Greene County Choose Environmental Excellence. For more information, call 417-864-2006 or visit www.springfieldmo.gov/showmeyards

Missouri One Call

Underground utilities exist in places you least expect—even within your own yard. Before you pick a location to plant a tree, be sure to call Missouri One Call, operating as a nonprofit Missouri corporation. They provide a single-point of contact for notification to its members through a state-wide, toll-free telephone number operating 24 hours a day, seven days a week. Call 811 or 1-800-344-7483 to request your utility locations. (www.mo1call.com)



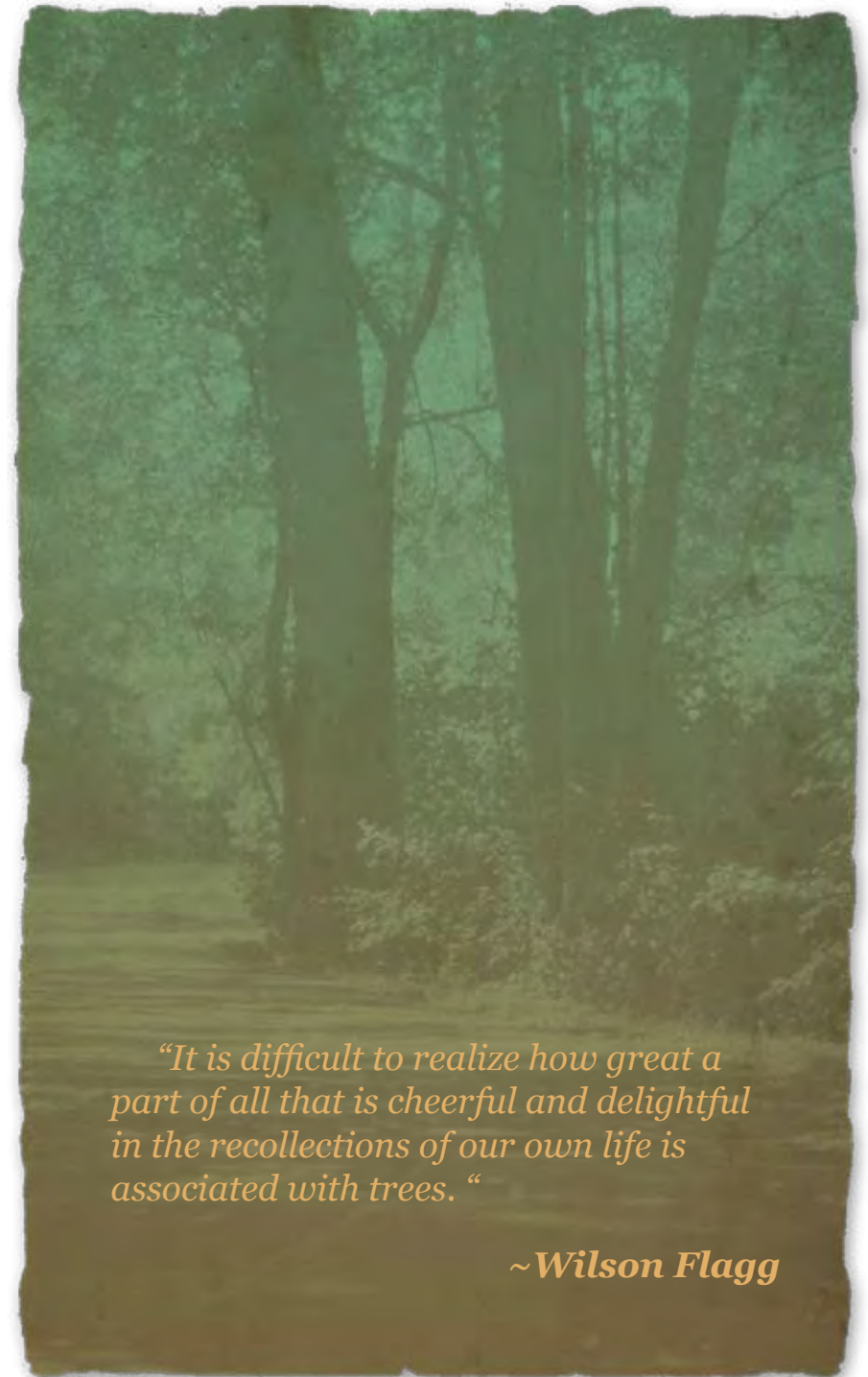


Arbor Day Foundation

The mission of the Arbor Day Foundation is to inspire people to plant, nurture, and celebrate trees. They envision a world where trees and forests are abundant, healthy, and sustainable, and highly valued by all people.

The Foundation strives to:

- Build an organization of dedicated members who lead the way, and help individual citizens plant and care for trees to enrich the environment.
- Enhance the extent, health, and care of the urban and community forests where we live.
- Advance rural land conservation and forest stewardship through the planting and care of trees.
- Help protect and improve the global environment by promoting rain forest preservation, urban and community forestry, and tree planting throughout the world.
- Educate and inspire young people and adults to understand, plant, and care for trees to build a better future.
- Expand the awareness of the need for tree planting and care by increasing publicity about Arbor Day and the number of people who celebrate Arbor Day.
- Manage Arbor Day Farm to support Foundation conferences and education programs, and to serve as a model of environmental stewardship. (www.arborday.org)



“It is difficult to realize how great a part of all that is cheerful and delightful in the recollections of our own life is associated with trees.”

~Wilson Flagg

QUICK REFERENCE

Local Contacts

www.cityutilities.net

(For information on where to plant, reforestation, and utility trimming, call City Utilities at 417-863-9000.)

www.mo1call.com

(Before you dig, call 811 or 1-800-344-7483.)

www.OzarkGreenways.org

(Ozark Greenways is a citizen's group dedicated to the preservation of greenspace through the creation of linear parks.)

www.parkboard.org

(For information on memorials and donations to City Parks, call the Springfield Parks Department at 417-864-1049.)

www.springfieldmo.gov

(For information on where to plant trees and their maintenance, call the Public Works Department at 417-864-1954.)

(For information on where you can take your yard waste, leaves, and brush, call the City of Springfield's Recycling Hotline at 417-864-1904.)

www.springfieldmo.gov/egov/boards/detail.jsp?id=35

(Tree City USA Citizens Advisory Committee advises City Council and appropriate City Departments regarding the city's trees and the community's urban forest, and assists in continuing to qualify Springfield as a Tree City USA community.)

www.springfieldmo.gov/webapps/buslic

(Verify city business license.)

www.springfieldmo.gov/trees/neighborwoods

(Develop and maintain our community forest by partnering with the citizens.)

www.springfieldmo.gov/trees/registry

(Awareness and appreciation of Springfield's urban forest.)

www.springfieldmo.gov/egov/boards/detail.jsp?id=35

(Coordinates the City of Springfield's participation in a number of activities that relates to the Tree City designation.)

Community Forestry Websites

www.arborday.org

(National Arbor Day Foundation is a nonprofit conservation and education organization. A million members, donors, and partners support programs to make our world greener and healthier.)

<http://extension.missouri.edu>

(Missouri Extension Center—one stop source for practical education on almost anything.)

www.extension.umn.edu/distribution/housingandclothing/dk6135.html

(Online copy of "Protecting Trees from Construction Damage: A Homeowner's Guide")

www.isa-arbor.com

(Locate certified arborists closest to you.)

www.mdc.state.mo.us

(Missouri Department of Conservation – information on community forestry programs, grants, and educational materials; or call 417-895-6880.)

www.mocommunitytrees.com

(Missouri's volunteer community forestry council.)

www.mocommunitytrees.com/whoweare.html

(Missouri Community Forest Council is committed to urban and community forestry issues in Missouri. The Council meets regularly to advise the State of Missouri on the best ways to preserve, protect, expand and improve our urban and community forests.)

www.nationalwildlifefederation.org

(National Wildlife Federation inspires Americans to protect wildlife for our children's future.)

www.epa.gov/hiri

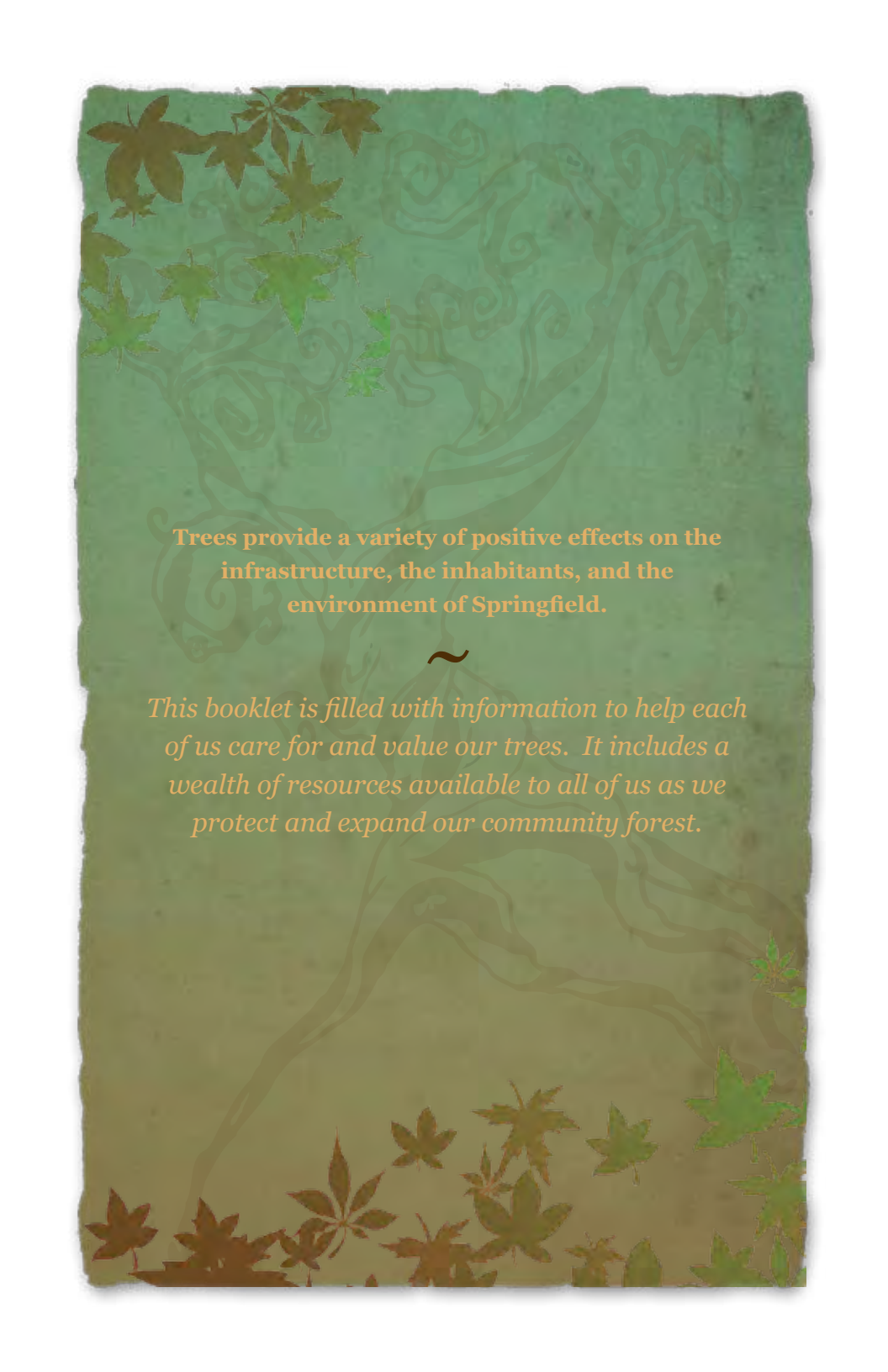
(Tips on how planting trees and other vegetation can help to reduce the urban heat island effect.)

www.GrowNative.org

(Helps protect and restore our state's biodiversity by increasing conservation awareness of native plants and their effective use.)

www.mdc.mo.gov/programs/forestkeepers

(Teaches citizens about tree and forest health.)



Trees provide a variety of positive effects on the infrastructure, the inhabitants, and the environment of Springfield.



This booklet is filled with information to help each of us care for and value our trees. It includes a wealth of resources available to all of us as we protect and expand our community forest.